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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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DEAN D. SMALL THE SMALL PATENT LAW GROUP LLP 225 S. MERAMEC, STE. 725T ST. LOUIS, MO 63105			EXAMINER CHENG, JACQUELINE	
			ART UNIT 3768	PAPER NUMBER
			NOTIFICATION DATE 04/15/2010	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Docket@splglaw.com

Office Action Summary

Application No.

10/652,747

Applicant(s)

GRITZKY ET AL.

Examiner

JACQUELINE CHENG

Art Unit

3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

DETAILED ACTION

Response to Arguments

1. The examiner notes the applicant's right and opportunity to submit a terminal disclaimer at such a time that the sole remaining issue is the double patenting rejection. Until then, the double patenting rejection still stands.
2. Applicant's arguments filed January 15, 2010 in regards to the "rendering box" of Brandl (US 6,450,962 B1) is not a plane with said volume set, the plane having a thickness, have been fully considered but they are not persuasive. The examiner respectfully disagrees with the applicants remarks. The examiner believes that Brandl is selecting a plane such as the plane defined by element 30 in fig. 2 (the rendering box). This plane would inherently have a thickness (even a 2D image has some sort of thickness, even if it's infinitesimally small), but in particular this plane has a thickness element 32 in fig. 2. Although the final result of the selected plane with a thickness encompasses multiple scan planes, the limitations of the claim does not preclude the selected plane having a thickness that would result in from being multiple scan planes. The size and the number of scan planes are not related to the selected plane. Furthermore Brandl explicitly states in col. 6 line 19-29 that to create the rendering box an operator selects a plane and then selects a suitable thickness for the plane.
3. The examiner also respectfully disagrees with the applicant's arguments that Argiro (US 5,986,662) does not disclose that multiple thicknesses can be selected or that Argiro does not disclose identifying a depth based upon an image data set. As to the multiple thicknesses, although col. 23 line 23-25 states that it is adjusting all of the displayed slices simultaneously,

Argiro also discloses in various places that only one of the displayed slices can be changed such as col. 14 line 33-37 which states that examination view component 114 permits a user to modify *AN* (one) MPR view by changing thickness and col. 22 line 49-52 states that any slice chosen by the cross hairs can be made to have thickness. As to the identifying a depth based on the image data set Argiro also fulfills this limitation. The applicant points out that Argiro automatically selects the middle slice of the viewing orientation and so therefore does not identify a depth, however the examiner believes that to select the middle slice of the viewing orientation (such as where the viewing orientation could be of C-planes) one must identify and use the depth of the data set in order to calculate which slice is the middle slice.

4. Furthermore the examiner also respectfully disagrees with the applicant's arguments that Argiro does not disclose identifying a subset of image enhancing techniques based on the transducer type of the ultrasonic device. Argiro identifies image enhancing techniques based upon the imaging protocol, which, in ultrasound, would be based upon the transducer type. Argiro obtains this information from the DICOM header which would hold information such as transducer type (col. 10 line 38-41).

5. Applicant's arguments with respect to whether Goto (US 2004/0165766 A1) is capable of processing data in real-time as taught by Sumanaweera (US 7,037,263 B2) have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. **Claims 1, 2, 5-7, 9, 10, 13, 14, 16-18, 21, 23, 24, 28, and 29** are rejected under 35 U.S.C. 103(a) as being unpatentable over Duarte (US 6,463,181 B2) in view of Brandl (US 6,451,962 B1). Duarte discloses a method for providing enhanced images wherein first image data such as three-dimensional ultrasonic data is acquired of a region of interest such as a chest (which has multiple anatomic features) (col. 9 line 24, col. 2 line 18-19, fig. 2 element 110). An image segment is then selected from the dataset to be processed (col. 3 line 25-27, fig. 2 element 130) by applying a variety of enhancement methods (multiple enhanced images) for the purpose of better visualization of certain types of features, such as contrast enhancement, or tissue density (based on multiple anatomic features using imaging techniques such as maximum or minimum density) (col. 3 line 61-63, col. 4 line 27-29, col. 4 line 43-45). The image enhancement methods can be selected by the user, or a variety of different enhancement methods can be selected by default (predefined, col. 3 line 61-63). These several enhanced images can be done on retrieved

images (after volume data set is stored on a memory, col. 3 line 53-56) or can be produced in real time while the volume data set is being acquired (col. 2 line 30-32, col. 9 line 17-19) and furthermore can be displayed simultaneously in real time (fig. 1 element 26, col. 3 line 6-9, col. 4 line 28-29, col. 9 line 40-42). Further image enhancement iterations can be produced if the user is not satisfied with the current enhanced image (col. 9 line 40-42). What Duarte does not disclose is the particulars of how the image segment is selected. It would therefore be obvious to use any well known method of selecting an image segment of interest such as disclosed by Brandl. Brandl discloses creating a rendering box to select the image segment of interest wherein the rendering box is created by selecting (identifying) a desired plane (which inherently has a thickness, and is obvious to be any plane such as a C-plane), and selecting a suitable thickness for the plane (col. 6 line 19-29). The thickness selected can be a pre-defined thickness (col. 4 line 3-7) which can be set depending upon the anatomical region of interest such as a thin rendering box for a tumor and a thick rendering box for an organ (col. 5 line 14-18).

9. As to the system claim, besides explicitly disclosing a processor (fig. 1 element 10) configured to process both in real-time and after data is stored (col. 3 line 53-56, col. 2 line 30-32, col. 9 line 17-19), a memory (fig. 1 element 24), a rendering setting control (fig. 2 element 150), and a display (output, fig. 1 element 26) as discussed above, Duarte also discloses an ultrasonic device (col. 9 line 25) but does not explicitly disclose the parts to the ultrasonic device from which the images are acquired. However it is inherent that an ultrasonic imaging device has a transducer which is capable of transmitting and receiving ultrasound signals, a receiver which is capable of receiving ultrasound signals comprising a series of adjacent scan planes, and a

processor capable of processing the images, identifying a plane with a thickness being transverse to the series of adjacent planes, and processing the plane with image enhancing techniques.

10. **Claims 3, 4, 7, 8, 11, 12, 14, 15, 19-22, and 25-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Duarte in view of Brandl, and further in view of Argiro (US 5,986,662). Duarte does not disclose the multiple enhanced images being based upon volume renderings, however it would be obvious to use any well known method of creating an enhanced image such as disclosed by Argiro. Argiro discloses a method for viewing a set of voxel data on a device from any well known imaging modality such as ultrasound (col. 10 line 30-32) and in particular it would be obvious to be the ultrasound data from Duarte. After the voxel data (such as the image segment of Duarte) has been input a protocol with a group of preset viewing settings shows up on a display. The protocol can then be automatically chosen depending on the type of input data such as a image taken with a particular transducer type (col. 12 line 7-28), or the user can select a particular image from the gallery of images provided each of which corresponds to a preset viewing setting of different volume rendering techniques (col. 4 line 17-25). These different volume renderings can be to enhance different parts of the body such as cardia or bone mass and they can be selected depending upon the application the user wants, such as most dense carida, or least dense cardia of the data set (col. 3 line 20-40). These images that are selected will appear in the examination viewer, which can be split into multiple subwindows where multiple images can be displayed simultaneously. To start off, the examination viewer shows the middle slice of the viewing orientation (of which the depth would need to be identified in order to calculate the middle slice), from there the examination view can be used to examine only certain

subvolumes of the image data (a plane having a thickness), and can have different thicknesses based on the multiplanar views (different image enhancing techniques) of views such as being in a 2D C-plane or a 3D volume (2D and 3D having different thicknesses), and can be used to adjust each image in each subwindow (col. 14 line 25-50). One of these adjustment parameters is to adjust the rotation, the particular slice chosen (repositioning to a second location), a slice thickness of the multiplanar reformatting views. By adjusting the slice thickness of each of the views each of the multiplanar views are transposed from being two-dimensional to being three-dimensional, the thicker slices in actuality being mini-volumes or slabs (col. 23 line 23-31). Therefore any desired images can be displayed simultaneously, multiple images volume rendered to display various anatomical features, multiple images of various plane thicknesses, multiple images of any well known volume rendering technique in the art (such as maximum density, surface texture, maximum transparency). It would be obvious to one skilled in the art at the time of the invention to process the ultrasound data from Duarte using the method of Argiro in order to use the images to provide a diagnosis and to create reports on the findings (abstract).

Double Patenting

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

12. Claims 1- 28 are rejected on the ground of nonstatutory obviousness-type double

patenting as being unpatentable over claims 1-18, 20, and 21 of U.S. Patent No. 7,108,658 B2.

Although the conflicting claims are not identical, they are not patentably distinct from each other because they both claim essentially the same subject matter.

13. Claims **1, 9, and 11** of the pending application and claims 1, 8, 12, and 16 of the patent (**1, 9, 11**:1, 8, 12, 16) both claim creating multiple enhanced images with the steps of acquiring a volume data set (such as a ultrasonic volume data set having multiple anatomic features), defining a plane within the volume data set (such as identifying a C-plane), processing the plane to form multiple enhanced images (such as enhanced images of a first subset and second subset, each with different thickness) and displaying the multiple enhanced images.

14. **2, 13**:2, 13 both claim the volume data set's anatomic features comprising at least one of bone, soft tissue, contrast and vessels.

15. **3**:3 both claim selecting and processing with volume rendering techniques.

16. **4, 8, 12**:1, 15 both claim the enhanced images being based on a thickness (depth) of the plane and different thicknesses (identifying different thickness of the subsets and processing the subsets to create enhanced images).

17. **5**:11 both claim processing volume data set with predefined image enhancing techniques, the enhanced images being based on different image enhancing techniques.

18. 6:10 both claim displaying the enhanced images in real time.
19. 7, 14:4 both claim selecting volume rendering techniques such as surface texture.
20. 10, 16:5, 7 both claim certain acquisition modes used such as B-flow (ultrasonic data).
21. 15:6 both claim identifying an acquisition type and defining a subset of the enhancing technique based upon the acquisition type.
22. 25, 26:9, 14 both claim modifying the location of the plane by either rotation or repositioning (changing the depth) and processing the changed location of the plane by displaying an updated enhanced image.
23. 27, 28:10, 15 both claim modifying a thickness and displaying the varied thickness in real-time.
24. **Claim 17, 18, 19, 23** of the pending application and claim 17 and 18 of the patent (17, 18, 19, 23: 17, 18) both claim an apparatus of a transducer, a receiver, a processor identifying and processing a plane with image enhancing techniques, an output for presenting multiple enhanced images, and an input for identifying a plane, and a thickness control setting (or second input) for setting thickness of the plane. Although the patent does not disclose a memory it would be obvious that processor systems have a memory for storing and retrieving data.
25. 20, 22: 21 both claim an input for receiving acquisition type, the processor identifying image enhancing techniques based on acquisition type.
26. 21, 24:20 both claim an input (such as a rendering setting control) for predefining said image enhancing techniques.

Conclusion

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACQUELINE CHENG whose telephone number is (571)272-5596. The examiner can normally be reached on M-F 10:00-6:30.
28. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
29. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jacqueline Cheng/
Examiner, Art Unit 3768